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September 22, 1994

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20054

Re: Ex Parte Presentation - PR Docket No. 93-61, RM-8013
Automatic Vehicle Monitoring

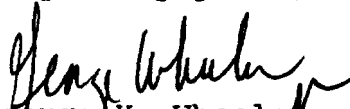
Dear Mr. Caton:

On behalf of Mark IV Industries, Ltd., I.V.H.S. Division, the attached is submitted to supplement discussion held on September 14, 1994, with Ralph A. Haller, Chief, Private Radio Bureau, F. Ronald Netro and Kelly Cameron, Esq. This letter with attachments is filed under Section 1.1206 of the Commission's rules for inclusion in the record of the above-referenced proceeding.

An original and one copy of this letter are submitted herewith for inclusion in the record of the above referenced proceeding. Copies of this letter are also being furnished to the foregoing persons.

In the event there are any questions concerning this matter, please communicate with the undersigned.

Very truly yours,


George Y. Wheeler

Enclosure

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FEDERAL COMMUNICATIONS COMMISSION
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Supplement to Proposals Discussed with FCC Staff:

In principle the 10 MHz bandwidth specified in the recent FCC staff informal proposal for short range AVI technologies is adequate for the proper operation of the Mark IV system. Mark IV's active technology allows very effective frequency reuse over relatively short distances, resulting in increased spectrum efficiency in an entire site installation. Other systems, such as those developed to meet the Caltrans system specification must employ more sensitive receivers, and therefore cannot reuse frequencies as easily as the Mark IV system, resulting in greater bandwidth required to monitor the same number of lanes.

The impact of the adoption of any proposal depends heavily, however, on some of the technical details of the rules adopted, which have not yet been fully developed within the proposals discussed. Therefore, we offer the following as constructive comments on these details.

1. Power Limits

Mark IV proposal: *Maximum Authorized Power Level: 30 Watts ERP at 10 meters antenna height where the gain of the antenna to calculate ERP is the maximum gain of the antenna in any direction outside of a cone of angle 45 degrees, vertically below the antenna, as installed.*

The nature of most ETC antenna installations are generally unconventional in that the antennas are basically pointed at the ground, in the direction of maximum gain. Furthermore, such antennas are generally designed to minimize energy emitted outside of a defined capture zone immediately below the antenna. As a result, such antenna installations have considerably less potential for causing (and receiving) harmful interference. This reduces the usefulness of traditional antenna height/power criteria as an indicator of potential of harmful interference. In order to capture this concept in a regulation, we propose that for the purposes of ERP calculation, the gain of the antenna be taken as the maximum antenna gain in any direction outside a cone of 45 degrees directly vertical below the antenna installation. Under these conditions, we would propose a maximum authorized power level of 30 Watts ERP at an antenna height of 10 meters.

2. Out of Band Emission Limits

Mark IV Proposal: *Out of band emission limits:*

Within 902-928 MHz.... $A = 40 + 10 \log (P)$ or an absolute level of -10 dBm.

Outside 902-928 MHz.... $A = 55 + 10 \log (P)$ or an absolute level of -25 dBm.

The NPRM proposed an out of band emissions limit formula which required attenuation from the maximum power level in band as follows: $A = 55 + 10 \log (P)$ where (P) is the output power in Watts. This formula essentially specifies a MAXIMUM ABSOLUTE VALUE for out of band emission limits. As we expressed in our comments on the NPRM, we fully agree with this philosophy with respect to specification of maximum out of band emission limits. However, we believe the precise value proposed is unnecessarily strict and will increase cost to our customers with little benefit with respect to the interference potential of systems operating in this band.

The maximum out of band emissions proposed are actually constant regardless of the power level.

if MEOP = Maximum Out of Band Emitted Power then

$$\text{MEOP} = \frac{P}{A}$$

where P is power and A is attenuation

since $A = (55 + 10 \log (P)) \text{ dB}$

$$10 \log (A) = 55 + 10 \log (P)$$

$$10 (\log (A) - \log (P)) = 55$$

$$\log (A/P) = 5.5$$

$$\frac{A}{P} = 10^{5.5}$$

$$A = P \bullet 10^{5.5}$$

$$\text{MEOP} = \frac{P}{A} \text{ Watts}$$

$$P \bullet 10^{5.5}$$

$$= \frac{1}{10^{5.5}}$$

$$10^{-5.5}$$

$$\text{MEOP} = -25 \text{ dBm power level}$$

By comparison a Part 15 device, operating unlicensed under Section 15.249 of the Commission's rules, is allowed to transmit within the 902-928 MHz band at a level of approximately -1 dBm. Equipment operating under Section 15.247 could transmit at up to +30 dBm output power. It

should also be noted that it will be rare that Part 15 devices will be operating near to a local area AVM facility. While we understand that out of band attenuation below the Part 15 limits may be desirable, we do not believe that requiring these to be between 24 and 55 dB lower than unlicensed Part 15 devices contributes to the efficient use of the spectrum by licensed or unlicensed users in the 902-928 MHz band. More stringent attenuation requirements outside of 902-928 MHz, however, may be of value. We have constructed prototype modules which comply with these requirements, which while technically feasible, increase the cost of the transmitter units by 50 to 75 per cent. Such an increase in cost does not appear justified in view of the fact that little benefit is attained.

In the recent ex parte communications filed by Mobilevision and Southwestern Bell, attenuation formulas are proposed which do not vary with authorized power level, but require additional attenuation as we move further from the authorized band edges.

We oppose this proposal because system designers in adjacent bands will not be able to count on a known expected level of interference from adjacent systems. We also see no benefit in additional attenuation as we move further from the band edge, as this makes parts of the band less useable than others and increases the uncertainty in the development and deployment of equipment. We believe the Commission's original proposal to set an absolute limit is a superior approach. However, as stated above we believe the actual limit could be relaxed somewhat without a negative impact on interference potential in the band.